

January 2010

Shell Artefacts and Shell-Working within the Lapita Cultural Complex

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Szabo, Katherine A.: Shell Artefacts and Shell-Working within the Lapita Cultural Complex 2010, 115-127.
<https://ro.uow.edu.au/scipapers/494>

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Abstract

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Keywords

within, shell, artefacts, complex, cultural, lapita, working, CAS

Disciplines

Life Sciences | Physical Sciences and Mathematics | Social and Behavioral Sciences

Publication Details

Szabo, K. A. (2010). Shell Artefacts and Shell-Working within the Lapita Cultural Complex. *Journal of Pacific Archaeology*, 1 (2), 115-127.

Shell Artefacts and Shell-Working within the Lapita Cultural Complex

Katherine Szabó¹

ABSTRACT

Despite a consistent presence in the archaeological record of the Lapita cultural complex, and their omnipresence in the associated literature, the nature and range of shell artefacts recovered from Lapita sites has only been partially summarized at best. Considering the categories of raw material choice, working techniques, formal artefact types and curation, this article summarizes our current knowledge and points to areas for further research.

Keywords: shell artefacts, shell artefact production, Lapita, curation

INTRODUCTION

The Lapita Cultural Complex, as initially described by Golson (1961) and subsequently in greater detail by Green (e.g. 1979), is a tightly cohesive and distinctive archaeological culture spanning the region from the Bismarck Archipelago, Papua New Guinea, in the west, to the West Polynesian archipelagos of Samoa and Tonga in the east. The earliest sites in the west, villages, date to c. 3300 BP, and Lapita sites occurred eastward across the range soon after. While the western portion of the Lapita region has a long history of human occupation (e.g. see Allen *et al.* 1989), the colonisation of islands east of the main Solomon Islands chain marks the first habitation of the scattered islands of Remote Oceania (Fig. 1), with a slightly earlier push to the north founding the occupation of western Micronesia (Rainbird 2004). Although characterized primarily by earthenware with complex dentate-stamped motifs, Lapita sites have other typical features in aspects of subsistence and economy, site location, and material culture. The last includes transported obsidian, stone adzes, and a distinctive suite of artefacts produced in marine shell (Green 1979; Kirch 1997).

While numerous trans-Lapita studies of earthenware pottery (e.g. Green 1978; Anson 1986; Summerhayes 2000a; Chiu 2003), as well as other aspects of Lapita culture such as obsidian transport (e.g. Ambrose 1976; Best 1987; Green 1987; Summerhayes 2003), and approaches to fishing (Kirch and Dye 1979; Butler 1988, 1994; Walter 1989) have been undertaken, papers dedicated to assessing the nature of, and variation in, Lapita shell-working are

rare. Kirch (1988a) presents the most inclusive review, in which he makes an argument for the localised production and extensive trade of shell artefacts. Based on data from excavations in the Mussau Group, Bismarck Archipelago, Kirch (1988a) compares artefact types, and the presence or absence of debitage indicating on-site production, with similar data from other sites where they were available. Aside from Kirch's work, detailed commentaries on Lapita shell artefacts tend to focus upon a specific geographic area (e.g. Sand 2001 for New Caledonia), or specific artefact types (e.g. Smith 2001 for *Trochus niloticus* rings) or raw materials (Smith 1991 for *Trochus niloticus* and *Tridacna* spp.). This paper is thus a summary review of Lapita shell-working and shell artefacts which seeks to bring together basic information on their nature and distribution.

Primary data are drawn from Szabó (2005), which included analysis of worked and midden shell from Kamgot (New Ireland), RF-2/Nenumbo (southeast Solomon Islands), Vao (Vanuatu), Lapita 13A and St Maurice-Vatcha (New Caledonia) and Naigani (Fiji) (see Figure 1 for site locations). Kamgot is a large, early Lapita village with extensive worked and midden shell deposits (see Summerhayes 2000b). RF-2/Nenumbo is a coastal village site excavated by Roger Green (1976, 1979) as part of the Southeast Solomons archaeological project which also yielded a number of shell artefacts and quantities of midden. A sample of the RF-2 shell midden was studied by Swadling (1986). The coastal Vao site was excavated by Bedford as a part of the 'Distance Education in the South-West Pacific: Culture Heritage Training' programme (Bedford and Leavesley 2003). The shell midden assemblage was studied in Vanuatu by the Vanuatu Cultural Centre and the material discussed here is only from the worked shell component separated by fieldworkers on-site. The important 13A and St Maurice-Vatcha sites in New Caledonia have recently been re-excavated by Sand and staff

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Paper received 4.2.10, accepted 26.4.10

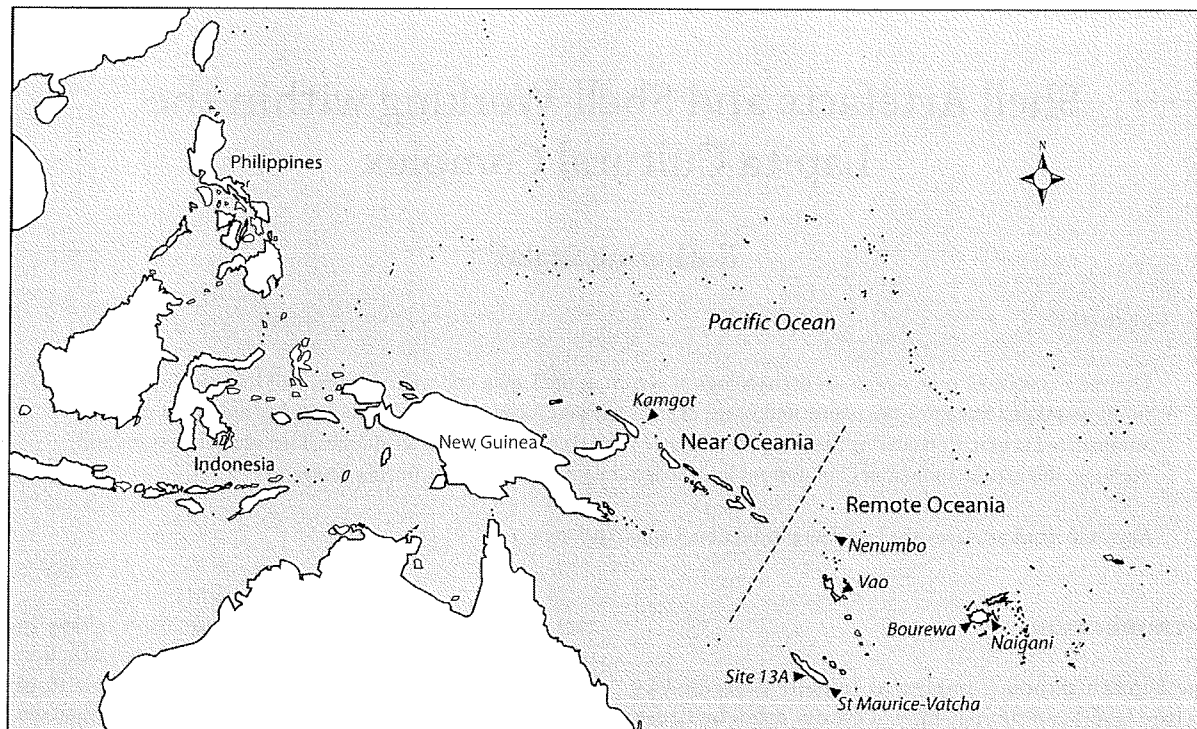


Figure 1. Map showing the geographic range of the Lapita cultural complex and sites mentioned in the text.

of the New Caledonia Museum (e.g. see Sand 1998, 1999, 2001). The large collections of worked shell were studied by Szabó (2005), and midden material was surveyed (although not formally studied) to give an idea of local subsistence-based gathering of shellfish. The Fijian village site of Naigani was excavated by Best (1981), and both worked and midden shell were studied by Szabó (2005), with the midden material having also been studied by Kay (1984).

Subsequent studies of worked shell from the recently-excavated site of Bourewa in Fiji (Nunn *et al.* 2004) have also been integrated. References to other sites are drawn from the Lapita literature. The question of links with either ancient Island Southeast Asian cultural practices, or those manifest before the appearance of Lapita pottery in the Bismarck Archipelago of New Guinea, are not considered here; before comparisons and conjectures are made, a good understanding of Lapita practices is a necessary prerequisite.

Shell artefacts are a ubiquitous and integral component of the Lapita cultural complex. While in some respects shell may be seen to replace scarce quality stone resources for tool production across sectors of the Lapita range, it is clear that shell is not a simple substitute material. As discussed here, within the Lapita cultural complex, shell is worked in a suite of distinctive manners to achieve particular pre-conceived ends. This paper will cover characteristic facets of raw material selection, modes of reduction, the range of artefact types produced, curation and

discard patterns, current gaps in our knowledge and new research directions.

RAW MATERIAL CHOICE

The tropical Indo-Pacific marine biogeographic province hosts, conservatively, ten thousand species of mollusc. Given this great diversity, it is worthy of note that Lapita shell-workers consistently selected a rather restricted range of species for transformation into artefacts. Not all species are available across the geographic range of Lapita sites, and some rise to prominence later in the Lapita period apparently independent of raw material availability.

The three most important shell taxa used across the Lapita spatio-temporal range include various species of Giant Clam (especially *Tridacna gigas*, *Tridacna maxima* and *Hippopus hippopus*), the Commercial Topshell *Trochus niloticus* and a suite of coneshells dominated by the large species *Conus litteratus* and *Conus leopardus*. All of these species occur naturally within the Melanesia–West Polynesia area but some are at their easterly limit here, with *Trochus niloticus* stated to not occur east of Fiji and Wallis (Eldredge 1994: 45) and *Tridacna gigas* having the same easterly range but also being found in Micronesia to the north (Rosewater 1965; Eldredge 1994). The specifics of these ranges are contradicted by archaeological findings, with *Trochus niloticus* being recorded for sites on Niuaotupapu, although in low numbers (Kirch 1988b: 225), as

well as Samoa in equally low numbers (e.g. Morrison and Addison 2008). Present-day occurrences beyond West Polynesia are evidently the result of 20th century translocations as a part of aquaculture initiatives (Eldredge 1994).

The large Green Snail *Turbo marmoratus* (Figure 2a) is used as a raw material for fishhook production within its natural range of occurrence, but this range is rather limited. *Turbo marmoratus* is found west of Fiji, but it is considered to be restricted to larger islands in Papua New

Guinea, the Solomon Islands and Fiji (but apparently not New Caledonia) (Eldredge 1994: 55). However, archaeological evidence would suggest that this is not entirely the case, with *Turbo marmoratus* fishhooks and debitage being identified on small islands such as the early Lapita site of Kamgot on the small island of Babase in New Ireland province, Papua New Guinea (Szabó and Summerhayes 2002, Szabó 2005), and Tikopia in the southeast Solomon Islands (Kirch and Yen 1982) (see Figures 2b and c). What

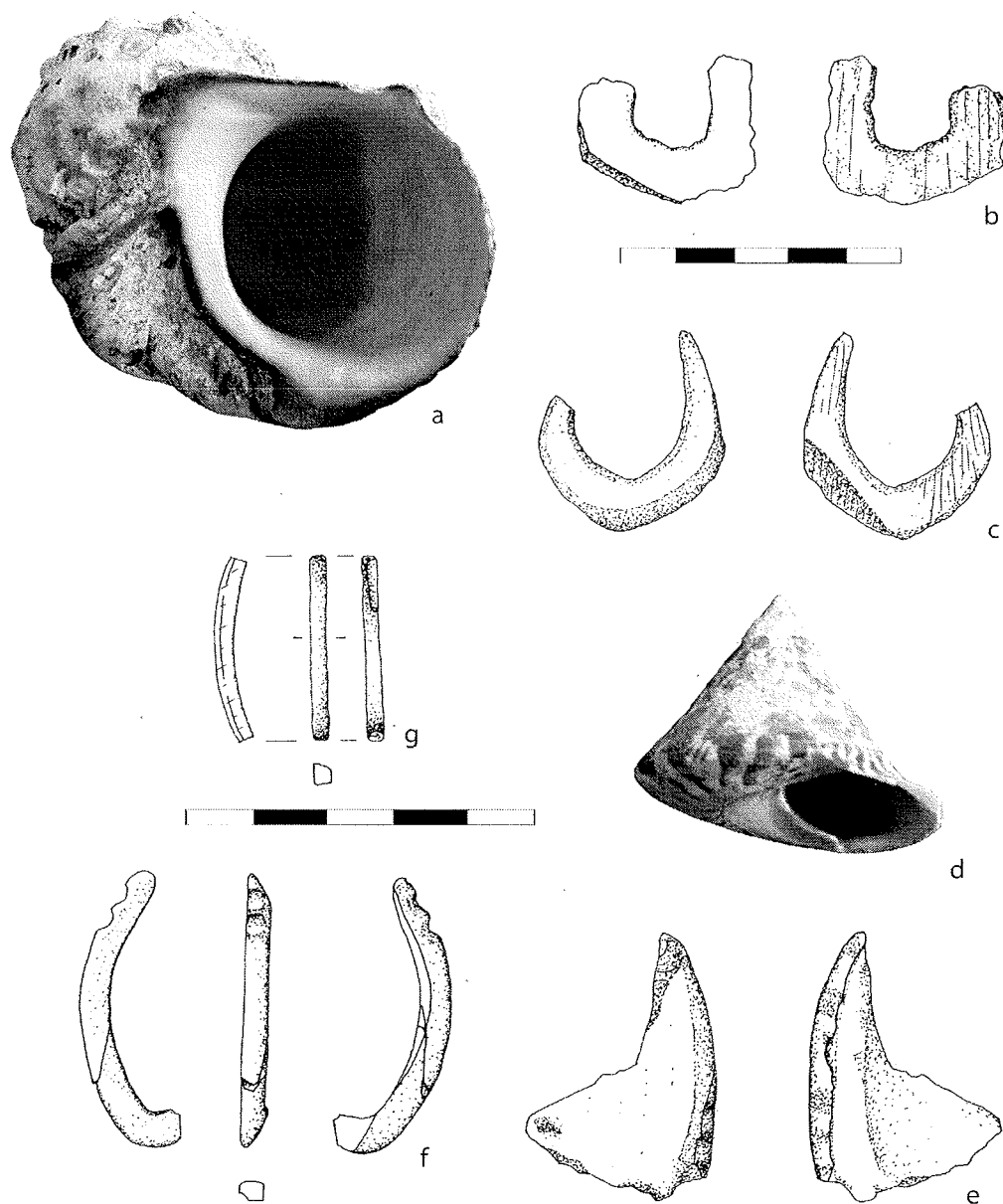


Figure 2. Lapita shell artefacts produced from *Turbo marmoratus* and *Trochus niloticus*. Clockwise from top left corner: (a) modern *Turbo marmoratus* shell; (b) *T. marmoratus* fishhook preform from Kamgot, New Ireland; (c) finished *T. marmoratus* fishhook from Kamgot, New Ireland; (d) modern *Trochus niloticus* shell; (e) broken *T. niloticus* fishhook blank from Kamgot, New Ireland, and; (f) finished and broken *T. niloticus* fishhook from Site 13A, New Caledonia; (g) *Trochus niloticus* ring fragment from Vao, Vanuatu. Scale bars are in centimetres.

both the archaeological evidence and the author's collecting experience would suggest is that populations of *T. marmoratus* are patchy across its natural range, and it is best described as 'locally common'. Where *T. marmoratus* is unavailable, medium-sized *Turbo* are used occasionally as raw material; particularly *Turbo argyrostomus* and *T. setosus* (e.g. Kirch 1993), and, rarely, other species (e.g. *T. petholatus* on Tikopia, Kirch and Yen 1982: 238).

Within the Conidae, a variety of different species was selected for manufacture into rings of varying sizes and widths, beads, curated ring units and small adzes. For larger artefacts, *Conus litteratus* and *Conus leopardus* predominate as raw materials (Figure 3a) with *Conus virgo* also being selected consistently at low levels. Smaller *Conus* artefacts tend to have been produced from *Conus eburneus* (Figure 3g), *Conus marmoreus* or the small *Conus ebraeus*.

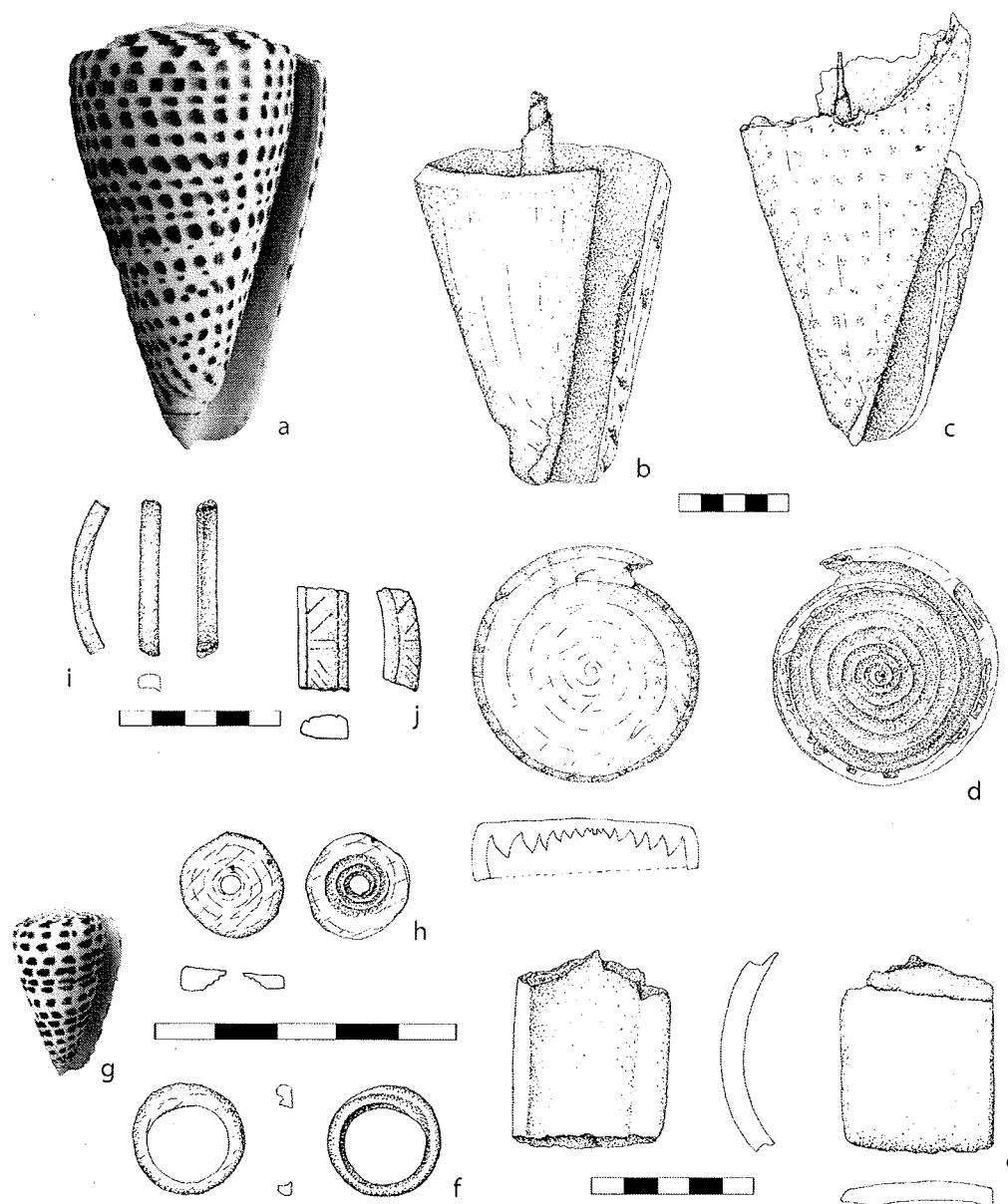


Figure 3. Lapita shell artefacts produced from *Conus* spp. Clockwise from top left corner: (a) modern *Conus leopardus* shell; (b) *Conus* sp. body detached by sawing from RF-2, southeast Solomons; (c) *Conus leopardus* body detached by direct percussion from RF-2, southeast Solomons; (d) detached and partially ground *Conus litteratus* or *C. leopardus* spire from Naigani, Fiji; (e) broken broad *Conus* ring fragment from RF-2, southeast Solomons; (f) small *Conus* ring from Naigani, Fiji; (g) modern *Conus eburneus* shell; (h) small *Conus* ring preform from Naigani, Fiji; (i) narrow *Conus* ring fragment from Naigani, Fiji; (j) narrow, incised *Conus* ring fragment from Site 13A, New Caledonia. Scale bars are in centimetres.

With the exception of the uniformly creamy *C. virgo*, all of the other species are white patterned with black spots (except in *C. marmoreus* which is black patterned with white markings). This is not an especially common colour combination or variety of patterning within the ~400 species of tropical Indo-Pacific Conidae. Indeed, it would appear that nearly all black/white spotted species have been deliberately targeted for selection (see Table 1), with the results of identification across a number of assemblages not reflecting the normal range of *Conus* spp. that is encountered on the reef flat or strandline assemblages.

There seems little reason to expect that taphonomic processes would obliterate patterning on other taxa, yet preserve it to an identifiable degree on black-white species. Whilst the grinding and abrasion that form part of the artefact production process removes much of this patterning, it is often retained to a greater or lesser extent on broad rings and curated ring units, and sometimes around the perimeter of beads and narrow rings. The consistent selection of such a restricted range of species, united by colouring and patterning but not size, indicates a Lapita aesthetic at play in the selection of *Conus* shells. Proposing any reasons for this choice would be purely speculative, but given that much of the patterning is usually ground or abraded away in the process of working, perhaps there is an analogy here with the application of paint over delicately dentate-stamped designs on pottery fragments (Bedford 2006).

Other species used less frequently, but still recorded from multiple sites, include the Chambered Nautilus (*Nautilus pompilius* as well as *N. macromphalus* in New Caledonia), the Pearl Oyster species *Pinctada maxima* and *P. margaritifera*, and various species of large (e.g. *Cypraea tigris*, *C. mappa*) and smaller (e.g. *C. annulus*) species of cowrie. The Thorny Oyster (*Spondylus* spp.) has been reported by Kirch (1988a) as being a major raw material for Lapita shell-working, but the use of this taxon appears to be focussed largely on the Mussau Islands (Kirch 1988a). Outside of the sites reported on by Kirch (1988a), only a single *Spondylus* bead from the early New Ireland site of

Kamgot has been identified (Szabó and Summerhayes 2002) with a further two beads of either *Spondylus* or *Chama* identified within recently-excavated samples at St Maurice-Vatcha on the Isle of Pines, New Caledonia (Szabó 2005). Another taxon of localised importance as a raw material is the Mangrove Pearl Oyster *Isognomon* sp. in New Caledonia (Szabó 2005).

MODES OF REDUCTION: VARIATION AND CONSTANCY

If the selection of a rather narrow range of species across the Lapita spatio-temporal range is notable, so too are both the range of reduction techniques applied to particular materials and the distinct reduction sequences followed to produce particular artefacts. It is currently difficult to be precise about reduction techniques, as the tools used for shell artefact manufacture have received little investigation. It is generally assumed that such tools are produced from stone, as well as other marine products such as fragments of branch coral and large urchin spines, and examples of faceted coral and urchin spines have indeed been identified from some sites (e.g. Kirch 1988b: 211–212). To date, no experimental production or use-wear studies isolating distinctive microscopic traces have been undertaken, but such work is currently underway.

Despite the current absence of experimental studies, some conclusions can be drawn from the nature of worked shell surfaces, especially when considered together with the particular micro- and macro-structural features of various types of shell (Szabó 2005; see also Szabó 2008 for an extended discussion of the Trochidae, Turbinidae and Conidae). The use of direct percussion to break up whole or large pieces of shell is generally an initial step in the creation of any shell artefact, but direct percussion is not used in isolation. It is followed by techniques which allow greater control over fracture and shaping, such as grinding, chipping and, or, abrasion.

As discussed in detail in Szabó (2008), indirect percussion and, or, pressure flaking with a sharp point are

Table 1. Table showing the relative proportions of 'spotted' *Conus* species within worked shell assemblages at studied sites. Worked shell includes artefacts, preforms, blanks and clear debitage. Spotted species include: *Conus litteratus*, *C. leopardus*, *C. eburneus*, *C. ebraeus* and *C. marmoreus*. 'Other' species identified include: *Conus stercusmuscarum*, *C. virgo*, *C. distans* and *C. coronatus*. All specimens which had traces of patterning/colour were identified to species level. Calculated from data presented in Szabó (2005).

Site	% spotted NISP	% other NISP	% unidentified NISP	Total sample NISP
Kamgot	28 (n=63)	2 (n=4)	70 (n=154)	221
RF-2	20 (n=12)	3 (n=2)	77 (n=47)	61
Vao	46 (n=6)	0 (n=0)	54 (n=7)	13
13A	19 (n=6)	6 (n=2)	75 (n=24)	32
Vatcha	27 (n=44)	4 (n=6)	69 (n=113)	163
Naigani	52 (n=28)	5 (n=3)	43 (n=23)	54
Bourewa	14 (n=33)	<1 (n=1)	86 (n=209)	243

techniques commonly used to shape shells that are composed of a mother-of-pearl (nacreous) inner layer with an outer, differently-composed prismatic layer, such as species within the Topshell (Trochidae) and Turban (Turbinidae) families. Sawing, on the other hand, tends to be used on tough shells with a low organic content, such as *Conus* spp., where a cross-bedded microstructure makes fracture somewhat unpredictable. A good example of the targeted use of sawing is seen with *Conus* broad ring production. In the production of narrow *Conus* rings, only the most robust part (shoulder and spire) of the shell is required. If the body whorl of the shell fragments or shatters, this is of little concern, and therefore direct percussion is a quick and easy way to isolate the section required for making the artefact (Figure 3c). For broad rings, however, the posterior section of the body whorl is required as it forms the body of the ring. Thus, the spire, shoulder and posterior body whorl are separated from the anterior of the shell by a laborious process of sawing around the circumference of the shell (Figure 3b). This more controlled method of shell reduction ensures that the requisite parts of the shell remain intact. It is likely that the greater labour and care that underpin *Conus* broad ring production account for this artefact type being reworked and reused, whereas broken narrow *Conus* rings are overwhelming discarded upon breakage (see 'Curation' below). This contrasts with earlier explanations which saw broad *Conus* rings as 'much less popular than the narrow variety', based on the greater numbers of broken narrow ring fragments recovered from excavations (Poulsen 1987a:197).

Based on our current understanding, there appears to be very little difference between the ways in which the same types of shell are worked, and artefacts are produced, from island group to island group across the Lapita range. However, short-cuts will sometimes be taken if the opportunity presents itself. Thus, small *Conus* shell beads recovered from RF-2 in the Southeast Solomon Islands are not culturally-modified, but rather they are beach-rolled spires with natural holes at the apices (Figures 4f and g) (Szabó 2005). These have apparently been collected opportunistically from the strandline and used as 'ready-made' beads, and are very similar to their culturally-produced counterparts at other sites. Likewise, some inspired time-saving at the site of St Maurice-Vatcha on the Isle of Pines, New Caledonia, saw pieces of ground *Conus* spire that had been removed in the process of ring manufacture reworked as beads (Figures 4d and e) (Szabó 2005). It is possible that the handful of *Conus* spp. adzes recovered from various sites across the Lapita range, including from the Bismarcks (Kamgot), Vanuatu (Vao) and various sites on Tonga (Poulsen 1987a, b) were also produced from the debitage of ring manufacture (in this instance the discarded body), but evidence associated with manufacture is currently too patchy to assess this possibility (see Figures 4b and c).

ARTEFACT TYPES

Lapita shell artefact assemblages are characterised by a number of standard types, generally produced consistently from the same raw material. Some of these artefact types are unique to Lapita sites, while others have histories of production linked in a continuum to earlier and, or, later periods. Table 2 outlines the major shell artefact types by descriptive category and raw material as well as the geographic zones of currently-recorded occurrence drawn from material presented in Szabó (2005) and the published Lapita literature. Temporal patterning is not considered in this table, although it may well be a significant factor in variation. Such geographic partitioning is not meant to imply any chronological meaning (e.g. 'Far West' does not equate to 'Early'), but it is done to draw out biogeographic factors in the distribution of raw materials across the Lapita spatial range.

Artefacts produced in *Tridacna* clam (see Figure 5a) include two forms of adzes, one made from the robust hinge section of the valve (Figure 5b), and the other triangular in profile and cut from the body of the valve (usually *Tridacna maxima*) on a 45° angle to the ribs and shell sculpture (Figure 5c). Large rings are also manufactured from *Tridacna* spp. valves, and include stout, heavy rings of varying morphologies (Figure 5d) as well as more delicate narrow rings, sometimes with an abraded groove around the perimeter (Figure 5f). A distinctively Lapita artefact made from the hinge area of *Tridacna* spp. valves is the long unit (Figure 5e). Made from a fully-ground quadrangular tablet of *Tridacna* shell, these artefacts are characterised by their distinctive perforations. At each end, two holes are drilled halfway through the artefact at a 90° angle, resulting in L-shaped perforations. While recorded at a number of sites in Remote Oceania, they do not appear to occur in Near Oceania, although Kirch (1988a) links the form to similar artefacts produced in *Spondylus* shell recovered from his excavations in Mussau.

Artefacts in *Conus* dominate Lapita worked-shell assemblages, with the most common type being the narrow ring (Figure 3i). As with narrow *Tridacna* spp. rings, these sometimes have an abraded groove around the perimeter and, in Southern Lapita sites in particular, occasionally more complex abraded or incised designs (e.g. Figure 3j). In addition to large-diameter rings, smaller (~1.5–2.5cm diameter) rings (Figure 3f), annular beads (Figure 4d–g), small adzes (Figure 4b and c) and perforated bracelet sections (Figure 4a, 6b and c) are also routinely produced in *Conus* spp. Ground and perforated *Conus* spp. spires are sometimes included as a standard type in discussions of Lapita shell artefacts (e.g. Spriggs 1996:88), although convincing illustrated examples are rare. As illustrated by Kirch (1997:238), at least some artefacts interpreted as 'ground and perforated *Conus* spires' are likely to be unfinished rings (e.g. Figure 3d). This is in contrast to the Philippine Neolithic, to which Lapita shell artefacts are often

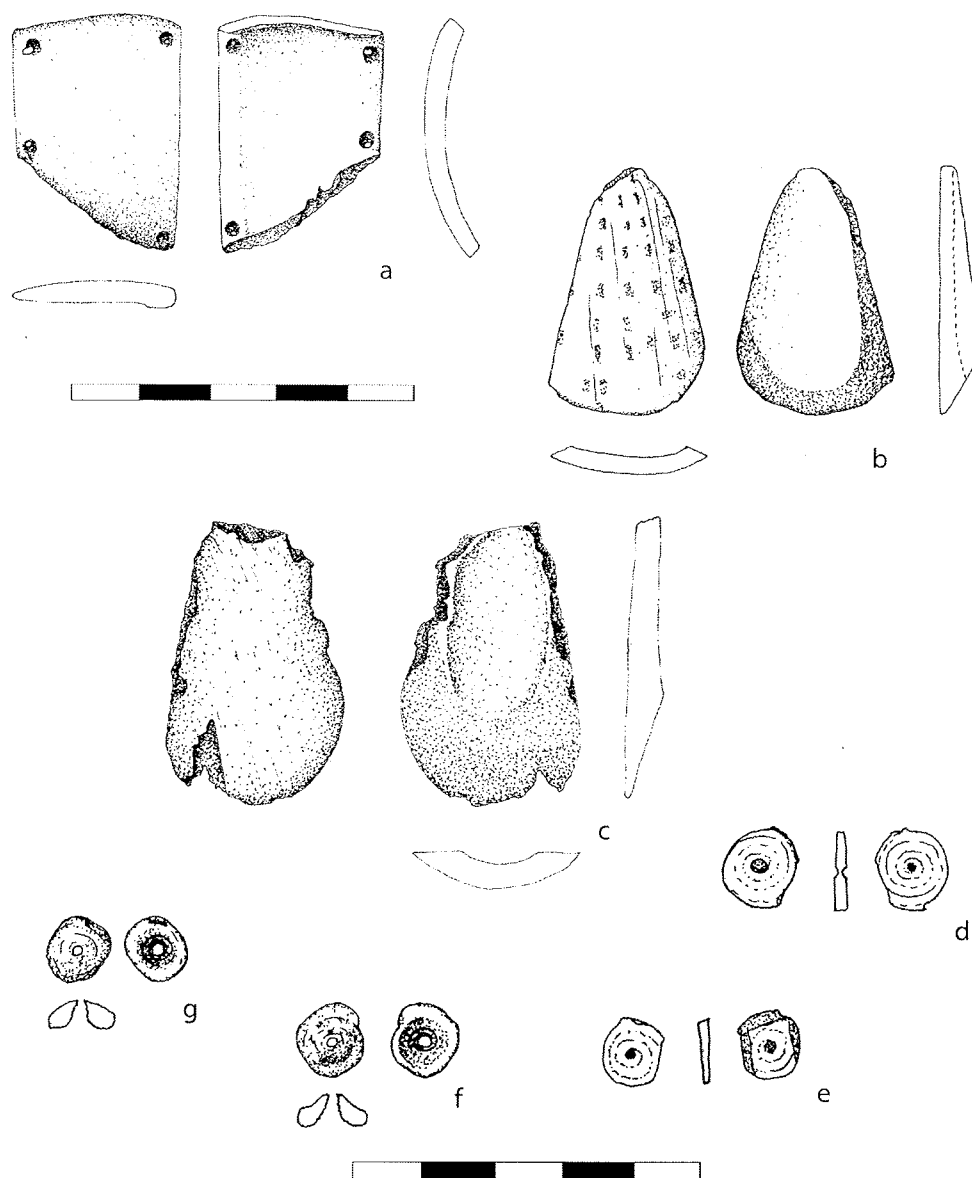


Figure 4. Further artefacts in *Conus* spp. Clockwise from top left corner: (a) curated broken broad ring fragment from RF-2, southeast Solomons. The top edge has been abraded smooth, while the lower edge is an unmodified break; (b) and (c) *Conus* adzes from Kamgot, New Ireland; (d) and (e) *Conus* bead preforms made from the inner spire portion of large *Conus* shells from St Maurice-Vatcha, New Caledonia; (f) and (g) naturally-modified *Conus* spires utilised as beads at RF-2, southeast Solomons. Scale bars are in centimetres.

compared, where ground and perforated *Conus* spires are not only very common, but clearly and consistently represent finished artefacts in their own right (e.g. Fox 1970; Szabó 2005; Szabó and Ramirez 2009).

Trochus artefacts are never abundant, but they are found across the Lapita spatio-temporal range, although with notably fewer records in Remote Oceania. One-piece *Trochus niloticus* fishhooks are common in Lapita sites of the Bismarcks (Figures 2e and f) (Kirch 1997; Szabó and Summerhayes 2002), but they are also found sporadically

in other places including New Caledonia (Sand 2000: 28; Szabó 2005). Both shanks and point-legs of compound trolling lures produced in *Trochus niloticus* have been recovered from Eastern Lapita sites in Tonga and Fiji (Burley and Shutler 2007; Szabó 2007). Large but delicate *Trochus niloticus* ring fragments have also been recovered from a number of Lapita sites (Figure 2g; see also Smith 2001).

Turbo marmoratus fishhooks are restricted seemingly to the Bismarcks and Solomons (Figures 2b and c), although some post-Lapita occurrences are recorded else-

Table 2. Formal shell artefact types and raw materials common within Lapita sites noted by geographic presence/absence.

Material	Artefact Type	Far Western	Western	Southern	Eastern
<i>Trochus niloticus</i>	One-piece fishhook	×		×	
	Lure shank or point-leg	×	×		×
	Ring	×	×	×	×
<i>Turbo marmoratus</i>	One-piece fishhook	×	×		
<i>Turbo</i> spp. – other	One-piece fishhook		×		×
<i>Conus</i> spp.	Broad ring	×	×	×	×
	Narrow ring	×	×	×	×
	Curated unit/broad ring	×	×	×	×
	Adze	×	×		×
	Small ring (1.5–2 cm diam.)		×?	×	×
	Bead	×	×	×	×
<i>Spondylus</i> sp.	Long unit	×			
	Bead	×		×	
<i>Tridacna</i> spp.	Hinge-section adze	×	×	×	×
	Dorsal-section adze	×	×	×	×
	Ring	×	×	×	×
	Long unit			×	×

where (e.g. a tentatively-identified fishhook from NT-91, Niuatoputapu (Kirch 1988: 204)). The Polynesian outliers of Tikopia and Anuta used other, smaller species of *Turbo* for the production of one-piece fishhooks (Kirch and Rosendahl 1973; Kirch and Yen 1982) at about the same time. For the remainder of Remote Oceania, *Turbo* shell fishhooks are uncommon within Lapita sites, and thus far absent from Lapita sites in Vanuatu, New Caledonia and Fiji.

In addition to the various types of formal artefacts described above and outlined in Table 2, occasional expedient shell artefacts have been identified. By expedient, I mean minimally-modified, or potentially even unmodified, shells that have been employed as a tool. Included in this category, amongst others, are shell peelers and scrapers, perforated shells interpreted as net-sinkers, and the somewhat elusive cowrie ‘octopus lure’. Often lacking clear traces of cutting, grinding, drilling, or other obvious signatures of human modification, such artefacts are frequently difficult to identify and easy to confuse with natural breakage patterns of particular shells, as well as taxon-specific taphonomic tendencies. Nevertheless, unambiguous abrasion facets on large cowrie (*Cypraea tigris*) dorsa from Talepakemalai in Mussau, and Vao in Vanuatu, present good evidence for expedient scrapers (Kirch 1997: 214, fig. 7.3; Szabó 2005: fig 5.57b respectively). Similarly, pierced cowrie and *Turbo* shells from Niuatoputapu (Kirch 1988b: 204–5), and perforated *Anadara antiquata*, *Codakia tigerina* and *Fimbria fimbriata* valves from Bourewa (Szabó, unpublished data) are convincing net-weights. Traces of use-wear, or systematic breakage inexplicable through taphonomic reasoning, need to be offered for the interpretation of expedient shell artefacts as argued by Spennemann in his investigations of putative

cowrie octopus lures and ark shell net-sinkers (Spennemann 1993a, b).

CURATION

Curation – the reworking and reuse of artefacts over an extended period of time – is not a process that has been considered at any great length within discussions of Lapita shell artefacts. Nevertheless, it is apparent that some Lapita shell artefact types were reworked in systematic ways, and that some artefact types are the result of such standard reworking procedures. Most notable in this respect is the reworking of broad *Conus* bracelets. Originally described as ‘rectangular units’ (Poulsen 1987a, b), numerous further examples of shaped and perforated *Conus* body sections over the intervening decades have made it apparent that these artefacts were not created from scratch, but were re-fashioned sections of broad bracelets.

The refashioning process itself is only partially standardized across the Lapita range, with variation in size and shape being seen even within sites. The clear unifying feature is the drilling of multiple perforations in the corners of (most often broad) ring fragment sections. In some instances, two holes were drilled at one end, but more commonly a hole was drilled in each corner, with the ring section probably forming part of a larger composite artefact (see Figure 4a, 6b and c). In some instances, the fractured edges are ground down resulting in a regular, finely-finished rectangular plaque (e.g. Figure 6b), but sometimes either both or one edge has been left raw, clearly indicating a former ring function. Examples of both fully-ground and partially ground specimens appear in the Lapita literature (e.g. Poulsen 1987b: 185, 189; Sand 2001: 85; Szabó

and Summerhayes 2002: 96; Szabó 2005: figure 5.38 for Nenumbo, 5.67 for 13A, 5.83 for St Maurice-Vatcha).

While curated *Conus* broad ring sections are found across the Lapita spatio-temporal range, they are, based on current published information, more common in Eastern Lapita sites, with Poulsen recording four for Lapita deposits in Tonga (Poulsen 1987b: 189), and over thirty be-

ing recorded for the Fijian Lapita site of Bourewa (Szabó n.d. and unpublished data). From this latter site, multiple episodes of reworking are common, with up to three separate instances of re-drilling after breakage seen on some artefacts (Figures 6b and c). In contrast, the large shell artefact assemblage from Kamgot, New Ireland, has a single curated unit (Szabó and Summerhayes 2002: 96).

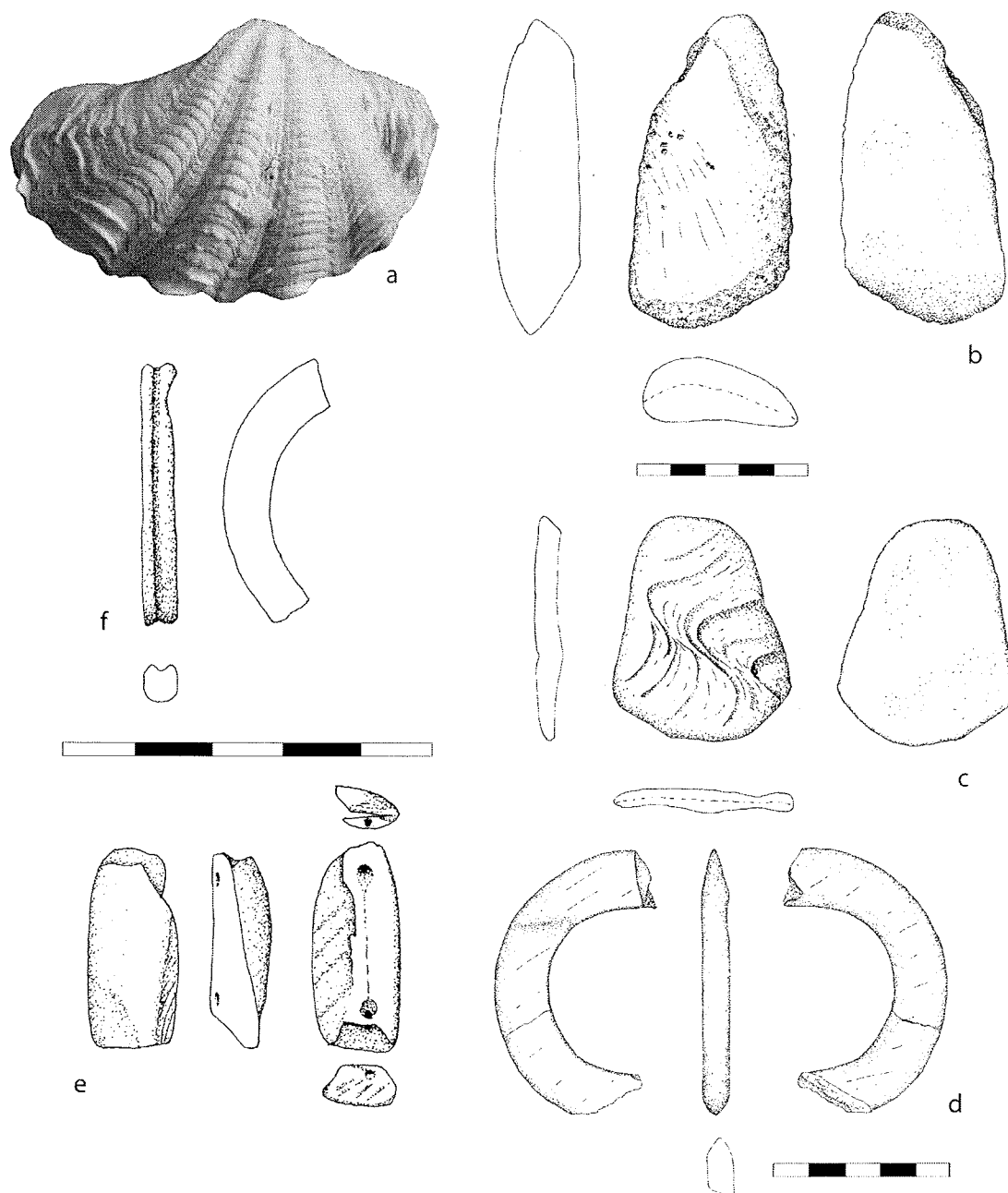


Figure 5: Lapita shell artefacts produced in *Tridacna* spp. Clockwise from top left corner: (a) modern *Tridacna maxima* valve; (b) *Tridacna gigas* hinge section adze from RF-2, southeast Solomons; (c) *T. maxima* dorsal or body section adze from RF-2, southeast Solomons; (d) large *Tridacna* ring from Vao, Vanuatu; (e) *Tridacna* long unit from Site 13A, New Caledonia; and (f) narrow, grooved *Tridacna* ring from Kamgot, New Ireland. Scale bars are in centimetres.

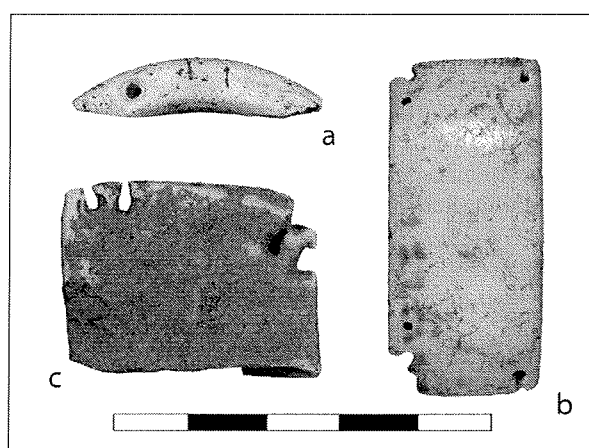


Figure 6: Curated shell rings from the Bourewa site in Fiji. Clockwise from top left: (a) broken and drilled narrow *Tridacna* ring, Bourewa X4: 20–30 cm; (b) curated *Conus litteratus* or *C. leopardus* broad ring fragment showing at least three re-drilling events, Bourewa X3: 90–100 cm; (c) curated *Conus litteratus* or *C. leopardus* broad ring fragment showing at least three re-drilling events, Bourewa X4: 50–60 cm. Scale bar is in centimetres.

The other type of artefact which is commonly re-worked and reused after breakage is the *Tridacna* ring (Figure 6a). Unlike rings in *Conus*, where narrow rings are not curated, both narrow and broad *Tridacna* rings occasionally show evidence of refashioning (e.g. Poulsen 1987b: 187 for Tonga). As with broad *Conus* rings, curated fragments of *Tridacna* ring are drilled, and may or may not be ground along fractured edges. Curated *Tridacna* rings appear to be less common in Vanuatu where *Tri-*

dacna rings themselves are a more common component of assemblages.

A NOTE ON TRADE

There have been few scholarly works dedicated to Lapita shell artefacts, with the most notable article authored by Kirch (1988a), who advances a bold argument that many Lapita shell artefacts could have been ‘trade valuables’. This idea not only linked shell artefacts in with known inter-island goods such as obsidian, but implied a deep antiquity to formal exchange systems expressed in the ethnographic present such as the Kula Ring (Malinowski 1922). Acknowledging that shell could not be chemically sourced in the same manner as obsidian and some other types of stone, Kirch (1988a) argued that the presence of shell artefacts together with manufacturing debris indicated a specialised production site, while sites with shell artefacts and no production debris represented end-consumers. Originally based on published and unpublished data from ten sites, the last two decades have witnessed not only the excavation and publication of further Lapita sites, but also re-excavations and re-analyses of some sites originally covered by Kirch (RF-2 Reef/Santa Cruz, Site 13 Lapita type site in New Caledonia and Naigani in Fiji, all in Szabó 2005). While a comprehensive revisiting of the data constitutes a paper in itself, an updated version of the original table including the ten sites presented in Kirch (1988: 111) suggests that the picture may have altered somewhat (see Table 3).

Further excavations at the New Caledonian Lapita type site, 13A, have produced evidence of *Tridacna* long unit production, although no finished specimens are present in the samples. The same sample produced evidence of *Conus* ring manufacture, as well as finished and

Table 3. An updated version of Table 2 (Kirch 1988a) incorporating new data from RF-2, 13A and Naigani. Information on other sites remains as presented in the original table. Additional and amended information is in bold. ‘x’ indicates the presence of a given artefact type, while ‘m’ indicates evidence of its manufacture. Brackets enclose uncertain occurrences.

Class	Mussau	R-F2 Reef/ Santa Cruz	Malo Vaunautu	TK-4 Tikopia	13A Lapita	Naigani Fiji	Yanuca Fiji	Lakeba, Lau	Tongatapu	Nuatoputapu
<i>Tridacna</i> long units	0	0	0	0	x	0m	0	xm	xm	0
<i>Spondylus</i> long units	xm	0	0	x	0	0	0	0	0	x
<i>Conus</i> rectangular units	xm	xm	0	0	xm	0	0	xm	x	0
<i>Conus</i> rings	xm	xm	(x)	xm	xm	xm	x	xm	x	x
<i>Tridacna</i> rings	xm	0	(x)	(0)	(0)	0	(x)	x(m)	x	x
<i>Trochus</i> rings	0	x	(x)	0	xm	0	0	xm	0	0
<i>Conus</i> discs	xm	0	0	(0)	0	0	0	x	x	x
<i>Conus</i> beads	xm	x	x	x	x	xm	0	xm	x	0
<i>Spondylus</i> beads	xm	0	0	x	0	0	0	0	0	x
Pendants	xm	x(m)	0	x	0	0	0	0	(0)	0

unfinished *Trochus niloticus* ring fragments. Ground *Conus* spires were recorded in the recent reanalysis (Szabó 2005) for both 13A and RF-2, but were interpreted as unfinished rings rather than *Conus* discs. Thus, in the table presented here they are classified as evidence of *Conus* ring manufacture rather than a separate class of artefact. In a similar way, manufacture of *Conus* rectangular units has been indicated as present at both RF-2 and 13A, as both contain evidence of *Conus* broad ring production and curation. Small, ground *Conus* spires were recorded for Naigani, but again these have been interpreted as unfinished small rings. No *Spondylus* beads were seen within the Naigani sample upon reanalysis (c.f. question by Kirch 1988a).

As well as increased evidence for shell artefact production at RF-2, Site 13A and Naigani, other major sites across the Lapita range show evidence of extensive shell artefact production and consumption. While few have been studied and, or, published in detail, examples include St Maurice-Vatcha in New Caledonia (Sand 1999; Szabó 2005), Lapita sites of the Arawe Islands (Smith 1991, 2001; see also comments in Summerhayes 2000b), Kamgot (Szabó and Summerhayes 2002; Szabó 2005), and Bourewa in Fiji (Nunn 2007; Szabó n.d. and unpublished data).

While shell artefacts were undoubtedly moving between islands with Lapita colonists, there are very few sites for which evidence of shell artefact production is absent, or indeed sites for which extensive evidence for production is coupled with a paucity of finished artefacts. Given this, a case for systematic, regular trade in shell artefacts is not clear-cut (see also Burley 1999). It is clear that there was more intensive shell-working going on at particular sites, but other factors such as site function, duration of occupation, access to raw materials, and spatio-temporal situation within the Lapita (i.e. early/late, Near/Remote Oceania) could prove interesting variables to consider in untangling these data. In addition, debitage from shell artefact production is not necessarily straight-forward to either recognise or define, and there is likely to be variation from analyst to analyst in the identification and interpretation of worked shell.

LAPITA SHELL-WORKING: CURRENT AND FUTURE RESEARCH DIRECTIONS

The prevalence of shell artefacts in Lapita sites, combined with the extensive degree of modification, make many Lapita shell artefacts fairly easy to recognise and characterise within a culture-historical typological framework. However, given the importance of shell as a raw material within the Lapita cultural complex, we can be sure that there are many more fragments of minimally-worked shell, expedient tools, and waste from formal artefact production which are currently undetected and, or, uncategorized (Szabó, in press). To date, an analytical reliance on formal, finished artefacts has largely sufficed, as the primary con-

cerns in discussion of shell artefacts centred on issues such as the description and definition of the Lapita cultural complex as a culture-historical grouping. But as questions about artefact production, use, and reuse emerge, a more nuanced and holistic understanding of shell-working is required. This will involve not only an enhanced understanding of the nature and properties of shell as a raw material, but detailed studies aimed at clarifying traces of use-wear and particular production techniques and tools. Certainly, there is much more to discover about the use and importance of shell artefacts within Lapita culture as well as the skills underpinning the nature of these diverse and elaborate artefacts.

Acknowledgements

Thanks are due to Glenn Summerhayes, the late Roger Green, Stuart Bedford, Christophe Sand, Simon Best and Patrick Nunn for generous access to shell material excavated by them as well as the background information necessary to contextualise samples. Thank you also to Atholl Anderson and Glenn Summerhayes for their help in facilitating this research, and the Department of Archaeology and Natural History, Australian National University, for financial support. This manuscript has greatly benefited from the comments of two anonymous reviewers and I thank them for their advice.

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